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AUTHOR Moore, Gary E.
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ABSTRACT

The results of a study to determine the relative effectiveness of written and audiotaped feedback to students are examined. Subjects of this study were education students in a university. One group of subjects received audio feedback on cassette tape on assignments; the other received written feedback. No statistical difference was found between written and tape-recorded feedback in improving student performance. It was found, however, that teachers found audiotape response less time consuming than written, and that students had a more positive attitude toward tape-recorded feedback than written feedback. (JD)

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Gary E. Moore
Assistant Professor of Education
G-10 South Campus Courts
Purdue University
West Lafayette, Indiana 47907
Phone 317-494-1755

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# PROVIDING INSTRUCTIONAL FEEDBACK TO STUDENTS IN EDUCATION CLASSES

by Gary E. Moore

## Abstract

Research has shown that providing students with individualized feedback promotes learning but does require considerable time. A study comparing the effectiveness, feasibility, and amount of faculty time required to provide alternative forms of feedback to undergraduate education students at Purdue University was conducted. Students were randomly assigned to receive either written or cassette audio tape recorded feedback in four education classes. Students had a more positive attitude toward tape recorded feedback. Less faculty time was required to provide audio tape feedback. Both types of feedback improved student performance.

Providing Instructional Feedback to

Students in Education Classes

The teacher educator today is beset with conflicting demands for his time. His students expect good teaching, personal consultation and careful examination and evaluation of their work. The university expects the professor to conduct research, write journal articles, and engage in other scholarly activities. All of these activities are time consuming.

In the "publish or perish" environment of many universities, the teacher educator may decide to spend more time writing journal articles and conducting research instead of using his time to provide students with ample feedback on their written work which they need for maximum improvement.

Research has revealed that students who receive extensive written comments on their work make greater improvement than students who do not receive extensive feedback. However, writing extensive comments on the written work of every student requires considerable time on the part of the professor; a sacrifice he may not be able to afford in his attempt to progress professionally.

Alternative methods of providing student feedback are needed which require less of the professor's time and yet provides students with indepth feedback needed for their academic improvement.

The Need for Instructional Feedback

Various researchers have examined the use of instructional feedback to promote learning. Page (1) in an experimental study involving 74 high school teachers and 2,139 students found that students had significantly better grades on their assignments when their teachers wrote extensive comments on their work as compared to students who received only a grade or a few written comments on their work.

Lesner (2) found that elementary students who received written teacher comments on corrected spelling tests showed significantly more gains on subsequent spelling tests than those who had not received comments.

A number of studies (3) have been designed to partially replicate Page's original study with students varying from elementary grades through college. While several of the studies failed to support Page's findings the conclusion reached by Stewart and White (4) after reviewing the studies was that the most consistent evidence for comment effectiveness was found at the college level.

In view of the research findings which indicate students benefit from instructional feedback it appears more of this type of feedback would be used in university classes, especially education classes. However, this writer (5) has heard numerous complaints from education students about the lack of feedback in their education classes. Students are disgruntled in these classes when a letter grade is scrawled across the top of their lesson plan, curriculum outline, or other assignment while no comments about what is right or wrong with the assignment are

given. This is especially disturbing to the future teacher when he is taught by the same teacher educator that each of his future students are individuals and should be treated as such by proding positive feedback and individualized instruction and help to each student. In view of this paradox it appears providing individualized feedback is a problem in teacher education classes.

Problems in Providing Instructional Feedback

An indisputable fact of life is that each day has 24 hours and providing individualized instructional feedback does require time. Wise use of faculty time is a matter that is becoming more important. Weldy (6) implies that educators may not be using time properly by writing, "Leaders in business and industry have become more concerned about ... use of time that have educational administrators."

Teaching classes, advising students, conducting research, evaluating students' work and providing feedback requires considerable amounts of time. Several studies (7) have revealed that university faculty members work 53-60 hours per week, with a high preponderance at 55-57 hours.

Because of the many time consuming demands made of teacher educators it could be argued that providing individualized feedback to students is not the wisest use of a professor's time. Stewart and White (8) advance this argument by writing, " ... while comments may have some positive effect ... the size of this effect may actually be quite small, especially when one considers the amount of time which a

teacher would expend to write comments on papers in the personalized manner which seems to be most effective."

On the other hand there are those who argue the primary function of an university is to instruct students and provide whatever assistance is needed for learning to occur. A recent editorial in The Purdue Exponent (9) reflects this view, " ... the university is designed to instruct students rather than place professors in the national spotlight for their accomplishments in the area of research." This view is shared on many campuses as a result of the demands for increased student rights in the late 60's and early 70's. Student evaluations of professors are important factors in decision making on many campuses.

It appears methods of providing individualized instructional feedback are needed which will provide students with the feedback they desire and need for improvement but will not require an excessive amount of faculty time to provide.

Alternative Methods of Providing Feedback

The traditional method of providing feedback to students on assignments has been the written word. A review of the literature on feedback reveals there are other methods of providing individualized feedback that may be effective and also utilize faculty time more effectively.

One method of providing individualized feedback that has potential is audio cassette tapes. Early in this decade Miller (10) writing in Engineering Education suggested using audio cassette tapes in a wide

variety of educational endeavors. Two years later, Hurst (11) writing in the same journal reported that using cassettes to provide feedback to students improved student report writing. Kohrs (12) was enthusiastic about the use of audio cassette tapes to provide feedback in college physical education classes.

Using cassette tapes to provide feedback is a simple procedure. As the professor reads a student's paper, he can speak his comments into a cassette tape recorder. Since speaking is faster and easier than writing, time should be saved while the extensiveness of the comments are increased. Cassette tape feedback could be used with a wide variety of assignments.

An added bonus of using verbal feedback on written assignments is the increase of 'personal attention' a professor can give a student by speaking directly to him, sharing his thoughts, giving encouragement along with criticism. Directional comments can be shared in more depth which may eliminate the need for further explanation before improvement can begin.

Comparing Written Feedback With Taped Feedback

In order to determine the effectiveness, feasibility, and amount of faculty time involved in providing two methods of individualized feedback a research study was funded by the Department of Education at Purdue University. Specifically, the study compared two methods of providing individualized feedback on written assignments - the traditional written comments and audio tape recorded comments. The amount of

faculty time required for implementation, the effects of such feedback on student achievement, and the reaction of students to each type of feedback was compared.

Methodology

Population Students in education classes at Purdue University were used in this study. The classes involved were two 200 level introduction to teaching courses with 50 students and two 400 level teaching methods classes with 31 students. This research was conducted during the 1976-77 school year.

Design The design of the study can be described as Campbell and Stanley's (13) experimental design 6, posttest-only control group design. The design is illustrated as follows:

$$R \quad X_1 \quad O_1$$

$$R \quad X_2 \quad O_2$$

Students within each class in this study were randomly assigned to one of the two treatment groups at the start of the semester. The treatments were: $X_1$ - Audio recorded feedback on assignments

$X_2$ - Written feedback on assignments

The students in treatment group one received audio feedback on assignments. Each student in this group was assigned a numbered cassette tape which was turned in with each written assignment. As the professor read and graded the assignment he recorded his comments on the tape and returned it with the assignment. Cassette tape players were available for students' use in the education workroom and the

library. At the end of the semester the cassette tapes were collected for use the following semester. Students in group two received traditional written comments.

Three different dependent variables were examined. Student achievement was one of the dependent variables. In the 200 level classes three critiques of articles in educational journals were required. A critique was handed in every two to three weeks. The assignment in the 400 level classes was to turn in a lesson plan every week. The difference in scores between the first and last assignment was used to dete mine student achievement. Additionally the amount of faculty time required in providing each type of feedback was analyzed. The third dependent variable, students' attitude, was measured using a ten item Likert-type instrument developed for this study. The instrument had moderate correlation between items and an alpha reliability of .69. A five point range was used for the responses. (See Table 1 for the instrument)

Findings

Student Attitudes The students who received the tape recorded feedback were more pleased with the manner in which they received feedback than were the students who received written feedback. The mean attitude score of 39 students who received taped feedback was 37.64 while the mean attitude score of 38 students who received written feedback was 33.23. This difference in attitude scores is significant at the .05 probability level using an independent sample t-test. ($t = 2.20$, $df = 76$, $p = .031$). There was no difference in attitude

according to the level of the class (200 vs 400).

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Insert Table 1 About Here

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An examination of the response to individual items on the instrument (see Table 1) tend to support the notion that tape recorded feedback is more personalized and provides more indepth feedback to students than does written feedback. Students who received tape recorded feedback perceived the instructor to be more interested in their progress than did the student who received written feedback (Item 10). Students who received tape recorded feedback believed they had a clearer understanding of what needed to be improved on their assignments (Item 9). Students who received written comments believed they could have turned in better assignments if the feedback method had been different (Item 7). The only drawback to taped feedback according to the students was that it was more inconvenient than written feedback (Item 8).

Faculty Time Usage Slightly less time was required to provide tape recorded feedback. The total amount of time required to provide tape recorded feedback to 43 students was 873 minutes for an average of 20.3 minutes per student. The time required to provide written feedback to 37 students was 866 minutes for an average of 23.4 minutes per student. (See Table 2). A savings in time of about 3 minutes per student was realized by using tape recorded feedback. As the level of the class increased so did the amount of time saved by using taped

feedback. In the 400 level classes a savings of ten minutes per student was realized using tape recorded feedback. No statistical analysis was performed on this data due to the variation in group sizes and variation in group assignments.

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Insert Table 2 About Here

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Student Achievement There was basically no difference in student achievement according to the type of feedback received. The students who were in the written feedback group had a mean score of 83.78 (out of a possible 100) on their first assignment while the tape recorded feedback group had a mean score of 83.64 on the same assignment. The mean score of the written feedback group on the final assignment was 90.33 while the tape recorded feedback group had a mean score of 91.72. (See Table 3) Analysis of Covariance using the first score as the covariate revealed no statistically significant difference between the two methods of providing feedback ($F = .45$, $df = 1,75$ $p > .05$), however there was a significant difference between the first and last scores ($F = 5.73$, $df = 1,75$, $p < .05$). This indicates feedback does improve student performance on later assignments. Both written and tape recorded feedback were effective in promoting student learning.

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Insert Table 3 About Here

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Discussion

In light of the findings, it appears providing students with individualized feedback via audio cassette tapes is a viable procedure, especially in upper level education classes. A savings of faculty time was realized by using tape recorded feedback. This was more apparent in the upper level classes. Using tape recorded feedback instead of written feedback would save some faculty time which could be used for professional or personal activities.

In this study there was no statistical difference between written feedback and tape recorded feedback in improving student performance. It appears that either method is as good as the other in improving student performance. The important point that should be made is that there was a tendency for both types of individualized instruction feedback to help students improve. A clue which may offer insight into why this happened is found in item 2 on the attitude assessment instrument. Students indicated they would like more feedback similar to the type they were receiving in other classes. This indicates students may not be receiving personalized feedback in their other classes. Therefore, any type of individualized feedback would be beneficial to the student.

Students had a more positive attitude toward tape recorded feedback than written feedback. Some educators believe students will perform better in a class if their attitudes are favorable toward the class. If this is true then individualized tape recorded feedback

should be helpful in developing positive attitudes. It certainly doesn't hurt to have students like part of a class.

Providing students with individualized instructional feedback via cassette tape should be considered by more teacher educators. The students like it, faculty time is saved, and most importantly--students learn.

Table 1

Students' Reaction to Type of Feedback on Assignments

| Statement | Tape (N=39) | SD | Written (N=38) | SD |
|---|---|---|---|---|
| 1. The manner in which feedback was provided on my assignments was dumb. | 4.03[a] | .90 | 3.71 | 1.04 |
| 2. I would like to have more of the type of feedback I received on the assignments in other courses. | 3.56 | 1.33 | 3.45 | .95 |
| 3. I had trouble understanding what needed to be improved on my assignments. | 3.18 | 1.43 | 3.26 | 1.06 |
| 4. The feedback on the assignments was helpful. | 3.67 | 1.06 | 3.61 | 1.00 |
| 5. Not enough feedback was provided on the assignments | 3.10 | 1.21 | 2.97 | 1.08 |
| 6. I liked the manner in which I received feedback. | 3.90 | .97 | 3.37 * | .94 |
| 7. I could have turned in better assignments if the manner in which I received feedback had been different. | 3.67 | .96 | 3.21 * | .91 |
| 8. The manner in which I received feedback on my assignments was inconvenient. | 3.31 | 1.22 | 3.87 * | .88 |
| 9. I had a clear understanding of what needed to be changed in order to improve on my assignments. | 3.90 | .88 | 3.26 * | .89 |
| 10. The manner in which I received feedback indicated that the instructor was interested in my progress. | 4.08 | .77 | 3.47 * | .86 |
| Total Attitude Score[b] | 37.64 | 10.44 | 33.23 * | 6.93 |

[a]The scoring was Strongly Agree = 5, Agree = 4, Undecided = 3, Disagree = 2, and Strongly Disagree = 1. However, Items 1,3,5,7, and 8 were written as negative items; therefore, the scoring of these items was reversed. A high score is desirable.

[b]Alpha reliability for this instrument is .69

* $p < .05$

Table 2

Teacher Educator Time Required to Provide Feedback

| Class | Class Size | Feedback Type | Total Feedback Time in Minutes | Mean Feedback Time in Minutes |
|---|---|---|---|---|
| ED240a | 12 | Written | 102 | 8.50 |
| ED240b | 11 | Written | 135 | 12.27 |
| ED440 Fall | 6 | Written | 179 | 29.83 |
| ED440 Spr. | 8 | Written | 450 | 56.25 |
| Sub-total | 37 | Written | 866 | 23.41 |
| ED240a | 14 | Tape | 100 | 7.14 |
| ED240b | 13 | Tape | 205 | 15.77 |
| ED440 Fall | 7 | Tape | 187 | 26.71 |
| ED440 Spr. | 9 | Tape | 381 | 42.33 |
| Sub-total | 43 | | 873 | 20.30 |

Table 3

Student Achievement According to Feedback Groups

| Feedback Group | Mean Score on First Assignment | SD | Mean Score on Last Assignment | SD | Difference in Scores |
|---|---|---|---|---|---|
| Written (N=40) | 83.78 | 10.61 | 90.33 | 9.71 | 6.55 |
| Tape (N=39) | 83.64 | 10.83 | 91.72 | 7.90 | 8.08 |

FOOTNOTES

1 Ellis B. Page, "Teacher Comments and Student Performance: A Seventy-Four Classroom Experiment in School Motivation," Journal of Educational Psychology, Vol. 49, August 1958

2 J. Lesner, The effects of pupil-corrected tests and written teacher comments on learning to spell in the upper elementary grades (Doctoral dissertation, University of California, Los Angeles, 1967). Dissertation Abstracts International, 1967, 28, 542A. (University Microfilms No. 67-09, 653).

3 For a complete list of the studies see Linda Graves Stewart, and Mary Alice White, "Teacher Comments, Letter Grades, and Student Performance: What do we Really Know?" Journal of Educational Psychology, Vol. 68, No. 4., p. 488-500.

4 Ibid, pp. 488-500.

5 Gary E. Moore, and Barbara A. Moore, "Comparison of Professors With Teaching Associates," NACTA Journal, Vol. XX, No. 1, March 1976.

6 Gilbert R. Weldy, "Time: A Resource for the School Administrator" (Reston, Virginia: National Association of Secondary School Principals, 1974).

7 T. Wayne Keene, "Selected Characteristics of Faculty Workload," presented at the American Association for Higher Education, Chicago, March 1971.
James McElhaney, "Attitudes of Selected Professors at Ohio State University, 1959).
*University of Michigan, "Faculty Workload Study" Unpublished date, Office of Institutional Research, University of Michigan, 1970.
*University of Minnesota, "Teachers Work 57 Hours," The Chronicle of Higher Education, March, 1970.
*WICHE, (Western Interstate Commission for Higher Education) "Studies of College Faculty" Boulder, Colorado, 1961.

8 Stewart and White, Op. Cit. p. 499.

9 The Purdue Exponent, "Teaching Ability Important to Promotion," (editorial) April 27, 1976.

10 David C. Miller, "The Audio Tape Cassette in Education," Engineering Education, Vol. 63, No. 6, p. 413-415, 440.

11 C. S. Hurst, "Cassette Grading Improves Student Report Writing," Engineering Education Vol. 65, No. 5, p. 429-430.

12 Karol Anne Kohrs, "Cassette Tapes: A Medium for Personal Feedback and Learning," The Physical Educator, Vol. 31, No. 3, p. 159-161.

13 Donald T. Campbell and Julian C. Stanley, Experimental and Quasi-experimental Designs for Research (Chicago: Rand McNally College Publishing Company, 1973).